

REMARKS

Claims 1, 3-7, 9-13 and 15-25 are pending in the present application. By this Response, claims 1, 7, 13 and 19 are amended and claims 2, 8, 14, 20 and 21 are canceled. Claims 1, 7 and 13 are amended to incorporate subject matter originally presented in claims 2, 8 and 14 in view of the allowable subject matter indicated by the Examiner. Claim 19 is amended to incorporate subject matter originally presented in claims 20 and 21. Reconsideration of the claims is respectfully requested.

Amendments were made to the specification to correct errors and to clarify the specification. No new matter has been added by any of the amendments to the specification.

I. Examiner Interview

Applicants thank Examiner Mayo for the courtesies extended Applicants' representatives during the September 13, 2004 telephone interview. During the interview, the differences between the prior art and the presently claimed invention were discussed. Examiner Mayo stated that she would consider the issues argued by the applicants. The substance of the interview is summarized in the remarks of Sections III, IV and V, which follows.

II. Allowable Subject Matter

Applicants thank Examiner McLean for the indication of allowable subject matter in claims 2-4, 8-10 and 14-16. By this Response, Applicants amend independent claims 1, 7 and 13 to include the allowable subject matter of claims 2, 8 and 14 as indicated by the Examiner on page 5, section 8 of the Office Action dated June 24, 2004. Claims 3-6, 9-12 and 15-18 are dependent on independent claims 1, 7 and 13, and, thus, are allowable by virtue of their dependency on independent claims 1, 7 and 13.

III. 35 U.S.C. § 112, Second Paragraph

The Office Action rejects claims 20-21 and 23-24 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, which applicants regard as the invention. This rejection is respectfully traversed.

As to claims 20-21 and 23-24, the Office Action states:

It is not clear from the specification nor the claims what is meant by a "dead element" or "used element".

The Examiner has interpreted "dead element" as an empty element and "used element" as an occupied element.

Applicants respectfully submit that the specification does provide adequate support for the terms dead element and used element. In the current specification, at page 12, lines 8-12 it clearly states:

In a used element stack, the memory location that both the head and base pointer point to prior to beginning the stack is used to store an element. However, in a dead element (or empty element) stack, as described above, the memory location in which both the head pointer and base pointer originate before the stack begins, is not used to store an element.

As supported by the specification, in a used element stack, the memory location that both the head and base pointer point to, prior to beginning the stack, is used to store an element. In a dead element stack, the memory location in which both the head pointer and base pointer originate before the stack begins, is not used to store an element. Thus, Applicants respectfully submit that the specification does provide adequate support for the terms used in claims 20, 21, 23 and 24, and the rejection of claims 20-21 and 23-24 under 35 U.S.C. § 112, second paragraph should be withdrawn.

IV. 35 U.S.C. § 102, Alleged Anticipation, Claims 19-21

The Office Action rejects claims 19-21 under 35 U.S.C. § 102(b) as being anticipated by Dupree et al. (U.S. Patent No. 5,655,133). This rejection is respectfully traversed.

As to claim 19, the Office Action states:

Regarding claim 19, Dupree discloses a processor (Figure 2; C 6, L 1-2); a memory (Figure 18, Reference 306; C 24, L 62); wherein the memory comprises a bi-directional stack (C 24, L 62, L 64-66).

Office Action dated June 24, 2004, page 4.

Claim 19 reads as follows:

19. A data processing system, comprising:
a processor; and
a memory; wherein
the memory comprises a bi-directionally growing stack, wherein the bi-directionally growing stack comprises at least one of a dead element stack and a used element stack. (emphasis added)

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. In re Bond, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. In re Lowry, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly teaches. Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Applicants respectfully submit that Dupree does not identically show each and every feature of the claims arranged as they are in the claims. Specifically, Dupree does not teach the memory comprises a bi-directionally growing stack, wherein the bi-directionally growing stack comprises at least one of a dead element stack and a used element stack.

Dupree is directed to a massively multiplexed central processing unit ("CPU") which has a plurality of independent computational circuits, a separate internal result bus for transmitting the resultant output from each of these computational circuits, and a plurality of general purpose registers coupled to each of the computational circuits.

While Dupree may teach a bi-directionally growing stack, nowhere in any section of the Dupree reference is bi-directionally growing stack that comprises at least one of a dead element stack and a used element stack taught. The Office Action merely alleges that, based on the Examiner's interpretation, the Dupree reference teaches this feature without providing a particular section of Dupree where this feature is taught. As shown

above, the current specification clearly states that in a used element stack, the memory location that both the head and base pointer point to, prior to beginning the stack, is used to store an element, and in a dead element stack, the memory location in which both the head pointer and base pointer originate before the stack begins, is not used to store an element. To the contrary, the Dupree reference teaches that a bi-directional stack where the user may choose the base address of the stack circuit, as well as which direction the stack grows, to higher or lower addresses (see column 24, line 67 to column 25, line 2). The Dupree user choosing the base address and the direction of stack growth is not equivalent to either a used element stack or a dead element stack as defined by Applicant's specification.

Thus, Dupree does not teach each and every feature of independent claim 19 as is required under 35 U.S.C. § 102. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 19 under 35 U.S.C. § 102.

Furthermore, Dupree does not teach, suggest or give any incentive to make the needed changes to reach the presently claimed invention. Absent the Examiner pointing out some teaching or incentive to implement Dupree such that a bi-directionally growing stack is comprised of at least one of a dead element stack and a used element stack, one of ordinary skill in the art would not be led to modify Dupree to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion or incentive to modify Dupree in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

V. 35 U.S.C. § 102, Alleged Anticipation, Claims 22-25

The Office Action rejects claims 22-25 under 35 U.S.C. § 102(b) as being anticipated by Krosh et al., ACM, "A Multiple-Stack Manipulation Procedure". This rejection is respectfully traversed.

As to claim 22, the Office Action states:

Regarding claim 22, Krosh discloses a stack stored in a linear memory array (Figure 2); wherein as elements are added to the stack, each of the added elements are placed into a next empty memory location at an

opposite end of the stack from the end of the stack that a previously added element was placed (Page 28, 1st column, 1st paragraph – Korsh indicates that the elements making up the stack space (stack comprises a stack pair) grow towards each other which indicates that the data is stored proportionally, current data is stored at an opposite end of previous data stored).

Office Action dated June 24, 2004, page 4.

Claim 22 reads as follows:

22. A memory system, comprising:
 a linear memory array; and
 a stack stored in said linear memory array;
wherein as elements are added to the stack, each of the added elements is placed into a next empty memory location at an opposite end of the stack from the end of the stack that a previously added element was placed. (emphasis added)

Applicants respectfully submit that Korsh does not identically show each and every feature of the claims arranged as they are in the claims. Specifically, Korsh does not teach that as elements are added to the stack, each of the added elements is placed into a next empty memory location at an opposite end of the stack from the end of the stack that a previously added element was placed.

Korsh is directed to a technique allowing multiple stacks to share sequential memory locations. While Korsh may teach a linear memory array and a stack stored in a linear memory array, nowhere in any section of the Korsh reference are elements added to the stack in a method where each of the added elements is placed into a next empty memory location at an opposite end of the stack from the end of the stack that a previously added element was placed. The Office Action alleges that this feature is taught on page 28, column 1, which reads as follows:

We propose a modification of Garwick's algorithm in which pairs of stacks grow toward each other. That is, stack $2i - 1$ occupies location j with $\text{Base}[2i - 1] < j \leq \text{Top}[2i - 1]$ and stack $2i$ occupies locations j with $\text{Top}[2i] \leq j \leq \text{Base}[2i]$, where $\text{Base}[2i - 1] \leq \text{Top}[2i - 1] \leq \text{Top}[2i] \leq \text{Base}[2i] + 1$, and $\text{Base}[2i] = \text{Base}[2i + 1]$. Odd numbered stacks grow in the direction of increasing i , and even numbered stacks in the direction of decreasing i .

Thus, Korsh teaches a method where odd numbered stacks grow in the direction of increasing i and even numbered stacks in the direction of decreasing i . That is, the Korsh

stacks grow in only one direction, depending on whether the stack is odd or even. In contradistinction, the presently claimed invention adds elements to a single stack in a method where each of the added elements is placed into a next empty memory location at an opposite end of the stack from the end of the stack that a previously added element was placed.

Thus, Korsh does not teach each and every feature of independent claim 22 as is required under 35 U.S.C. § 102. At least by virtue of their dependency on independent claim 22, the specific features of dependent claims 23-25 are not taught by Korsh. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 22-25 under 35 U.S.C. § 102.

Furthermore, Korsh does not teach, suggest or give any incentive to make the needed changes to reach the presently claimed invention. Absent the Examiner pointing out some teaching or incentive to implement Korsh such that as elements are added to the stack, each of the added elements is placed into a next empty memory location at an opposite end of the stack from the end of the stack that a previously added element was placed, one of ordinary skill in the art would not be led to modify Korsh to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion or incentive to modify Korsh in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

Moreover, in addition to their dependency from independent claim 22, the specific features recited in dependent claims 23-25 are not taught by Korsh. As shown above, the Korsh stacks are grown where odd numbered stacks grow in the direction of increasing i and even numbered stacks in the direction of decreasing i. Growing stacks in this manner does not teach a used element stack, where the memory location that both the head and base pointer point to, prior to beginning the stack, is used to store an element, as recited in claim 24. Furthermore, growing stacks in the Korsh manner does not teach a dead element stack, where the memory location in which both the head pointer and base pointer originate before the stack begins, is not used to store an element, as recited in claim 23.

Additionally, though Korsh does not specifically teach removing elements from a stack, Applicants respectfully submit that Korsh would only remove elements in reverse of how elements are added. Thus, Korsh would remove elements from odd numbered stacks in the direction of decreasing i and even numbered stacks in the direction of increasing i . That is, the Korsh would remove elements from a stack only one direction, depending on whether the stack is odd or even. In contradistinction, the presently claimed invention removes elements from the stack, where a next element removed is removed from a memory location at an opposite end of the stack from a location of a previously removed element.

Therefore, in addition to being dependent on independent claim 22, dependent claims 23-25 are also distinguishable over Korsh by virtue of the specific feature recited in these claims. Accordingly, Applicants respectfully request withdrawal of the rejection of dependent claims 23-25 under 35 U.S.C. § 102.

VI. Conclusion

It is respectfully urged that the subject application is patentable over the prior art of record and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

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